CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

CLEANUP AND ABATEMENT ORDER NO. 6-98-19

**REQUIRING MOLYCORP, INC. TO
CLEAN UP AND ABATE THE EFFECTS OF WASTE DISCHARGES
TO GROUND WATERS OF THE
IVANPAH AND AMARGOSA HYDROLOGIC UNITS FROM THE
MOUNTAIN PASS MINE AND MILL SITE**

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Regional Board), finds:

1. Discharger

Molycorp, Inc. (Molycorp) operates a mine and mill in Mountain Pass (Mountain Pass Mine and Mill), which recovers and produces various compounds/products from lanthanide metals. For the purpose of this Order, Molycorp is referred to as the Discharger.

2. Facilities

Molycorp's Mountain Pass Mine and Mill generates wastes and products that historically have been discharged into both lined and unlined waste piles, landfills, surface impoundments and tailings ponds. For the purposes of this Order, the Surface Impoundments and Tailings Ponds are collectively referred to as the Disposal and Storage Facilities. Wastes generated and products stored by Molycorp include solids, liquids, and mixtures of solids and liquids. The liquids consist of product waters (water in contact with solid product) and wastewaters. The following constituents have been identified as being present in at least one of these wastewaters/product waters at concentrations above the background quality for ground waters: total dissolved solids (TDS), strontium, nitrate, barium, lead, gross alpha, gross beta, radium, thorium, uranium, sodium lignin sulfonate, color.

Molycorp is currently discharging a tailings slurry and other wastewaters to the North Tailings Pond (P-16), which was constructed in 1967. P-16 is an unlined tailings pond.

Results for sampling of ground water monitoring wells installed by the Discharger indicate wastewater constituents from P-16 are currently leaking to ground water causing a pollution. The results also indicate wastewater constituents from other unlined Disposal Facilities and from unlined Storage Facilities have leaked to ground water causing a pollution. Some of these facilities are closed or no longer in use. The leakage has created ground water plumes that have migrated and merged in some areas. The commingled plumes also include degraded ground water zones located adjacent to polluted ground water.

The Discharger has constructed Ground Water Corrective Action Systems, which currently include the:

a. P-16 System consisting of two ground water extraction wells (95-1RW and 97-1RW) located around P-16, and well(s) located in the open pit which collect water before it enters the pit,

b. Western Drainage System consisting of two ground water extraction wells (Wells RW-1 and RW-2) located at the entrance to the area that drains into Shadow Valley (Amargosa Hydrologic Unit), and

c. Eastern Drainage Systems consisting of the following facilities located in Wheaton Wash (Ivanpah Hydrologic Unit):

i. Mexican Well System consisting of a subsurface concrete cut-off wall constructed across the wash in shallow alluvium and three ground water extraction wells (Well MEX-1A, 2A and 3A) located on the upgradient-side of the wall.

ii. Farmer's Wash System which consists of a subsurface infiltration trench constructed across shallow alluvium in the wash and one ground water extraction well (Well FW) located within the trench.

The Mexican Well System is located in the entrance to Wheaton Wash at a site referred to as Mexican Well. The Farmer's Wash System is located further downgradient in Wheaton Wash, approximately 1.0 mile from Mexican Well just downgradient of where Farmer's Wash enters Wheaton Wash.

3. Location

The Disposal and Storage Facilities, Ground Water Corrective Action Systems and Monitoring Wells (except those described below) are located in Sections 11, 12, 14, and 15, T16N, R13E and Sections 30 and 31, T16N, R14E, SBB&M on land owned by the Discharger.

The following are located in Wheaton Wash on land owned by the US Government and administered by the United States Department of the Interior (Bureau of Land Management):

a. Farmer's Wash Ground Water Corrective Action System and Ground Water Monitoring Wells SRK-21A, 94-15MWU and 94-15MWL located in Section 32, T16N, R14E; and

b. Ground Water Monitoring Wells SRK-20U and SRK-20L located in Section 31, T16N, R14E, SBB&M.

4.

Waste Discharge Requirements

Revised Waste Discharge Requirements (WDRs) for Molycorp's Mountain Pass Mine and Mill operation are prescribed by the Regional Board in Board Order No. 6-91-836 (WDID No. 6B362098001), which was adopted on June 13, 1991.

5. History

Almost all of the unlined Disposal and Storage Facilities were constructed during the period between 1966 and 1984. The Discharger clean closed most of the unlined Facilities between 1984 and 1991. The revised WDRs incorporate requirements of Chapter 15, Title 23, California Code of Regulations (CCR). Title 23, CCR (Chapter 15) is currently re-codified in 27 CCR § 20005 et seq.

Board Order No. 6-91-836 states that P-16 is leaking to ground water and includes a schedule requiring the Discharger to provide a tailings disposal facility by January 1, 1996 that prevents leakage. The Order requires that the facility comply with the construction standards contained in Chapter 15 (23 CCR §2572), which is currently re-codified in 27 CCR §22490.

Ground water is present in fractured bedrock underlying P-16. Molycorp has installed extraction wells to control P-16 leakage prior to reaching ground water through the P-16 Ground Water Corrective Action System. The current System does not capture all wastewater leaking from P-16. The ground water extraction wells for the System are installed in the fractured bedrock. Because of complex geology beneath the Mine and Mill area, capturing all leakage from P-16 by ground water extraction wells may not be possible.

In a number of areas, wastewater continues to rise to the ground surface in violation of WDRs according to the Draft Environmental Impact Report, Molycorp Mountain Pass Mine Expansion Project, San Bernardino County, December 1996. The areas are located in the Upper Wheaton Wash drainage area between P-16 and Mexican Well. Surfacing wastewater is a violation of WDRs. Regional Board staff notified the Discharger regarding concerns that the extraction system may not be able to capture all leakage in a letter dated June 6, 1995 and the need for a lined tailings disposal facility in letters dated February 7, 1997, October 2, 1997 and December 12, 1997. The Discharger has not prevented leakage from the tailings facility, constituting a violation of WDRs.

To address the ground water plumes, WDRs (Board Order No. 6-91-836) require Molycorp to provide a complete Ground Water Monitoring and Response Program. The Order requires the Program to include a complete definition of the extent of the plumes and a ground water corrective action program as specified in Article 5, Chapter 15, which is currently re-codified in 27 CCR §20380 through 20435.

The Discharger has installed monitoring wells in response to the requirements of the WDRs. Results of quarterly ground water sampling rounds submitted since 1994 indicate the Discharger has not completely defined the extent of the commingled plumes. In addition, the results indicate that polluted ground water is present downgradient of the

Ground Water Corrective Action Systems located in the Western Drainage and Eastern Drainage (Wheaton Wash). This shows that the Systems are not completely effective in containing and preventing pollutant migration. Regional Board staff notified the Discharger of this problem in letters dated June 6, 1995 and January 20, 1998.

To obtain data on the potential impact of radiological constituents to ground water, Board staff requested Molycorp (Pursuant to California Water Code §13267), to conduct radiological sampling of its ground water monitoring wells and submit the results to the Regional Board. The letter also requested that Molycorp submit to the Board all past radiological sampling results available in its files. Molycorp is completing the requested actions.

6. Water Quality Control Plan (Basin Plan)

The Regional Board adopted an amended Water Quality Control Plan for the Lahontan Region (Basin Plan), on March 31, 1995.

7. Beneficial Uses

The beneficial uses of ground waters contained and defined within the Ivanpah Hydrologic Unit (612.00) and the Shadow Hydrologic Subarea, Silurian Hill Hydrologic Area, Amargosa Hydrologic Unit (609.24) as set forth and defined in the Basin Plan are:

Beneficial Use	**Ivanpah Ground Water**	**Shadow Ground Water**
Municipal and Domestic Supply (MUN)	X	X
Agricultural Supply (AGR)	X	X
Industrial Service Supply (IND)	X	
Ground Water Recharge (GWR)	X	X

Regional Board staff evaluation indicates MUN is the most sensitive beneficial use of ground water within and immediately beyond the zone of the commingled plumes.

8. Water Quality Objectives

For the purposes of this Cleanup and Abatement Order, naturally occurring background water quality is referred to as the Background Water Quality Objective (WQO), which is also referred to as the Non-Degradation WQO. The Basin Plan establishes cleanup standards for Waters of the State at the Background WQO. A discharger may submit a request for a ground water cleanup standard greater than the Background WQO but not to exceed the Upper WQO. The Regional Board reviews information submitted by a discharger to support such requests. Based on this information and information provided by other interested parties, the Regional Board determines whether a request can be approved; and if it can be approved, the basis on which approval can be granted. At the present time, the Discharger has not submitted such a request.

9. Violations and Threatened Violations of Board Order No. 6-91-836

Pollutant concentrations listed in the attached Table 1 are in violation of the two narrative WQOs contained in the Basin Plan, which are:

(1) the Upper WQO that states: "Ground waters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) ...," and

(2) the Background WQO that states: "existing high quality shall be maintained until or unless it has been demonstrated to the State that any change in water quality will be consistent with the maximum benefit of the people of the State, and will not unreasonably affect present and probable future beneficial uses of such water."

Pollutant concentrations in the ground water (see Table 1) are adversely affecting the MUN beneficial use listed in the Basin Plan for the ground water. The contaminant concentrations, therefore, constitute a pollution, as defined in California Water Code (CWC) §13050. Because the boundary of the plume is not defined and may be migrating, it threatens to violate WQOs for downgradient ground waters. The Discharger has failed to implement an acceptable Ground Water Monitoring and Response Program as required by 27 CCR §20380 through §20435.

The Discharger is violating and threatening to violate the following requirements contained in Board Order No. 6-91-836:

Discharge Specifications No. I.B.1., which states, in part:

"1. ..... the discharge of waste shall not cause the presence of the following substances ..... in the ground waters.... of the Ivanpah or Amargosa Hydrologic Units:"

"c. any of the following indicator parameters in concentrations that exceed background water quality:"

"(2) barium (Ba)
(3) strontium (Sr)"
"(5) nitrate nitrogen (NO_3 as N)
(6) total dissolved solids (TDS)"

Discharge Specifications No. I.C.4., which states, in part:

"The discharges ... shall not cause a .... pollution as defined in Section 13050 of the California Water Code or a threatened pollution."

Discharge Specifications No. I.C.5., which states, in part:

" ... Surface flow or visible discharge of waste water to adjacent land areas ... is prohibited."

Provision 6., which states, in part:

"The discharger shall submit the following for the Main Tailings Pond (P-16):" [by]

"c. January 1, 1996"

Demonstrate full compliance with Discharge Specifications I.C.5. and I.C.7."

Discharge Specifications No. I.C.5., which states, in part:

All surface impoundments ... shall be brought into compliance with the requirements of Section 2572, (Siting and Construction Requirements) ... Article 7, Chapter 15, CCR for Group B mining wastes."

Discharge Specifications No. I.C.7., which states, in part:

"All surface impoundments.....shall prevent the migration of wastes from the surface impoundment to adjacent geologic materials, the vadose zone, or ground water during the use, disposal operations, ...This requirement applies to P-16 (Main Tailings Pond) in accordance with the time schedules adopted herein." [Refers to time schedules in Board Order No. 6-91-836.]

Provision 11., which states, in part:

"The discharger shall perform the following items ... " [by]...January 1, 1996".... "The discharger shall bring the project into full compliance with Discharge Specifications I.C.4."

Discharge Specifications No. I.C.4., which states, in part:

"The discharges to any active ... surface impoundments ... shall not cause a .... pollution as defined in Section 13050 of the California Water Code or a threatened pollution."

10. Reason For Action

Sampling results indicate Disposal and/or Storage Facilities have leaked the following constituents to ground water causing concentrations in ground water above background water quality: TDS, strontium, nitrate, barium, sodium lignin sulfonate, gross alpha, gross beta, uranium and radium. Concentrations of these constituents exceed the level above which impairment of beneficial uses (pollution) occurs as summarized in the attached Table 1.

The Discharger has discharged waste into waters of the State and has created a condition of pollution of ground water.

Because the boundary of the plumes is not defined, the Discharger is threatening to cause pollution (and violation of WQOs) of downgradient ground water.

11. Statutory Authority

CWC §13304 states in part: "Any person who has discharged or discharges waste into waters of this state in violation of any waste discharge requirement or other order or prohibition of a regional board.... or who has caused or permitted ... or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the State and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the Regional Board cleanup such waste or abate the effects thereof or, in case of threatened pollution or nuisance, take other necessary remedial action."

12. California Environmental Quality Act

This enforcement action is being taken by this regulatory agency to enforce provisions of the California Water Code and, as such, is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, §21000 et seq.) in accordance with 14 CCR §15321.

IT IS HEREBY ORDERED that, pursuant to California Water Code §13267 and §13304, the Discharger shall:

1. Abate the discharge of waste from P-16 to ground water by either ceasing the discharge to the pond or by complying with Chapter 15 (23 CCR §2572 currently re-codified in 27 CCR §22490) and Discharge Specifications contained in WDRs in accordance with the following schedule:

   a. By **April 15, 1998**, submit to the Regional Board a narrative description of **Alternate Locations and Designs** for a new lined tailing disposal facility, should this be the discharger's proposed method of compliance.

   b. By **June 1, 1998**, submit to the Regional Board a **Conceptual Facility Design** and location for the alternative selected by Molycorp.

c. By **December 31, 1998**, submit a complete **Revised Report of Waste Discharge** for any new lined tailings disposal facility, should this be the discharger's proposed method of compliance.

d. By **October 1, 1999**, begin construction of the any lined tailing disposal facility, should this be the discharger's proposed method of compliance.

e. By **April 1, 2000**, complete construction of any new lined tailings disposal facility, should this be the discharger's proposed method of compliance.

2. In accordance with the schedule below, implement a Ground Water Monitoring and Response Program as required by Article 5, Chapter 15 (currently re-codified in 27 CCR §20380 through 20435) that:

a. will contain the boundary of the commingled plumes and thereby cease violations and threatened violations of Basin Plan WQOs for downgradient ground waters, and

b. will, in a timely manner, cleanup and abate the effects of pollutants in ground water that are present at concentrations violating Basin Plan WQOs.

3. By **July 1, 1998**, submit to the Regional Board a **Draft Site Investigation Workplan** to conduct an investigation to determine the characteristics, and vertical and areal extent of impacted surface and or ground water beneath and in the vicinity of the site. The following shall be included:

a. An **Evaluation of Design and Construction for Existing Ground Water Monitoring Wells** to determine if any wells are or may be acting as vertical conduits for transporting either surface water or pollutants. (Include conclusions and recommendations for each existing well, including recommendations for wells that need to be destroyed.)

b. **Field Workplan** showing maps and design plans describing the proposed number, locations and designs of surface and ground water monitoring points. The proposed monitoring points shall be sufficient to locate the following boundaries:

i. Background WQO Boundary, which is defined for the purpose of this Order, as the boundary surrounding the ground water monitoring points where one or more Background WQO is exceeded.

ii. Upper WQO Boundary, which is defined for the purpose of this Order, as the boundary surrounding the monitoring points where one or more Upper WQO listed in the attached Table 1 is exceeded.

iii. Isoconcentration boundaries for each of the Upper WQOs listed in the attached Table 1.

iv. Contaminants remaining in soil which are impacting or threaten to impact water quality.

c. A **Health and Safety Plan**.

d. A **Sampling and Analysis Plan** including field and laboratory methods for all Constituents of Concern and laboratory Quality Control/Quality Assurance.

e. A **Investigation Derived Waste Disposal Plan**.

f. Any proposals for **Interim Corrective Action**.

4. By **August 1, 1998**, submit a copy to the Regional Board of any complete **Application(s) for Land Access** that were sent to landowners to request permission to conduct site investigation required for compliance with this Order.

5. By **September 15, 1998**, submit a **Final Site Investigation Workplan**, including the information described in item 3 a) through f) above, and addressing comments received on the Draft Site Investigation Workplan.

6. By **October 15, 1998**, implement the **Site Investigation Workplan**.

7. By **March 1, 1999**, submit to the Regional Board a **Site Investigation Report** describing the investigation. The following shall be included:

a. A description of work performed, tabulated analytical results, well logs, copies of laboratory reports, waste classification and disposal locations for drill fluids, and other relevant information.

b. Plan-view and cross-sectional-view maps, which include:

i. the Background and Upper WQO Boundaries, and isoconcentration boundaries described in Order No. 3.b., above;
ii. areas up to 2.0 miles beyond the boundary of affected ground;
iii. ground water table equipotential contour lines;
iv. contaminated soils which may threaten water quality;
v. property boundaries;
vi. boundaries of US Geologic Survey sections, townships and ranges;
vii. buildings, dwellings, and other significant structures; and
viii. locations of existing monitoring and water supply wells (both active and inactive) including ownership of land on which the wells are constructed.

8. By **March 1, 1999**, submit to the Regional Board a **Feasibility Study Report** that evaluates appropriate Ground Water Corrective Action alternatives and includes, but is not limited to:

   a. results of mathematical modeling including cleanup time estimates and projections for any proposals,

   b. cost evaluations, and

   c. the Discharger's recommended cleanup alternative.

9. By **March 31, 1999**, the Discharger shall submit to the Regional Board a **Revised Report of Waste Discharge** for revision of WDRs, including the following:

   a. A report containing a revised **Water Quality Monitoring and Response Program** complying with the requirements of 27 CCR ∋20380 through 20430, which includes a **Ground Water Corrective Action Program** proposal.

   b. A revised **Closure and Post-Closure Maintenance Plan** complying with 27 CCR ∋ 21400.

   c. A revised **Instrument of Financial Assurance** adequate to cover the costs of Closure, Post-Closure Maintenance and all Known and Reasonable Foreseeable Releases for the entire Facility.

   d. A **Cleanup Level/Degradation Analysis Application** for any proposed cleanup standards greater than background or proposals to allow plume boundary migration (in the event the Discharger's recommended alternative involves such proposals.)

   e. A **Time Schedule** for implementing the Ground Water Corrective Action Program.

10. By **July 1, 1999**, implement an acceptable Ground Water Corrective Action Program following approval.

11. All work plans and technical reports are to be reviewed and signed by a California registered Geologist, Civil Engineer, or Certified Engineering Geologist. Additionally, all of the field activities are to be conducted under responsible charge of one or more of these professionals.

The Executive Officer is authorized to name adjacent landowners or operators as Dischargers, and amend this Order naming them, if they fail to provide Molycorp with full property access in a timely manner to allow off site investigation and routine monitoring work to proceed.

Failure to comply with the terms or conditions of this Cleanup and Abatement Order will result in additional enforcement action that may include the imposition of administrative civil liability and/or referral to the Attorney General of the State of California for such legal action as he or she may deem appropriate.

Ordered by: _____ Dated: _____

HAROLD J. SINGER
EXECUTIVE OFFICER

Attachment: Table 1

Table 1

[Concentration for Non-radiological and radiological Constituents are in milligrams/liter and pico curies/liter, respectively]

Constituents	Water Quality Objectives		Maximum Concentrations in Commingled Ground Water Plumes	Ground Water Downgradient of Ground Water Corrective Action Systems	
	Back-ground Objectives[1] Well 93-1MW[2]	Upper Objectives[3]	Well SRK-12[4] (unless noted otherwise)	West Drainage Well 94-14MWU[3]	East Drainage Well 94-15MWU[3]
TDS	391	500	37,482.0	17,290	1,205
Strontium	0.4	4.2	426.7	33.9	85
Nitrate as N	3.42	10	85[5]	10.7	2.5
Barium	0.10	1	12.28	5.19	0.15
Color	Not tested	15 units	>15[6]	Not tested	Not tested
Sodium Lignin Sulfonate	Non-Detect[7]	None	510[8]	Non-detect	Non-detect
Gross Alpha	4.15	15	256[9]	175	6.7
Gross Beta	4.05	50	264[10]	138	31
Uranium	3.65	20	57.9[10]	22.3	15.8
Radium	0.274	5	9.9[11]	7.4	0.3

[1] Background may vary in the Mountain Pass area.
[2] Each result for TDS, strontium, nitrate and barium is an average of quarterly sampling rounds for Well 93-1MW reported in First Quarter 1997 Self Monitoring Report, Molycorp, Inc. Radiological results are for two analyses for samples collected by Molycorp staff from Well 93-1MW on March 15, 1994 as requested by Regional Board letter dated February 10, 1994.
[3] All objectives are the Primary Maximum Contaminant Level (MCL), with the exception of the objectives for TDS, color and strontium. The objective listed for TDS and Color are the Secondary MCLs. The objective for strontium is the US Environmental Protection Agency (USEPA) Lifetime Health Advisory, which is based on data published in the USEPA's Integrated Risk Information System (IRIS) for waters used in domestic supply systems.
[4] Each result for TDS, strontium, nitrate and barium is an average of quarterly sampling rounds for the given well. Results were reported in First Quarter 1997 Self Monitoring Report, Molycorp, Inc. sodium lignin sulfonate, gross alpha, gross beta, uranium and radium values are the maximum of results for one sampling round for every monitoring well located in the Mtn Pass area. Results are reported in First Quarter 1997 Self Monitoring Report, Molycorp, Inc.
[5] Well 94-11MW
[6] During compliance inspections, staff has observed ground water samples collected near P-16, which exhibit a dark brown color that would exceed 15 color units. Color levels above background are due to the presence of sodium lignin sulfonate.
[7] Man-made chemical not detected in natural occurring waters.
[8] Well 94-2MW
[9] Well SRK-29
[10] Well 94-10MW
[11] Well 94-1MW